CLAIMS

5   What is claimed is:

1.   A system for coding compound frames of data to be sent over a
transmission channel, comprising:
       accepting a frame of data at an input of a data coder;
10   dividing the frame of data into one or more data blocks;
       classifying the one or more data blocks as either picture blocks or
non-picture blocks according to a set of criteria;
       selecting either a picture block or a non-picture block as a next block
to be coded;
15   comparing the selected block to a block in a frame previous to the
accepted frame;
       if the selected block is within a threshold difference of the block in
the previous frame, generating a signal to use the block in the frame
previous to the accepted frame, otherwise,
20   if the selected block is a non-picture block, compressing the
selected block using a first compression method, and dividing the selected
block into at least two non-picture layers; and
       if the selected block is a picture block, compressing the
selected block using a second compression method, and dividing the
25   selected block into at least two picture layers.

2.   The method of claim 1, further comprising selecting one of the
group consisting of the signal to use the block in the frame previous to the
accepted frame, the at least two non-picture layers, and the at least two
30   picture layers as data to be transmitted over the transmission channel,
and transmitting the selected data over the transmission channel.

3. The method of claim 1, wherein compressing the selected block using a first compression method and dividing the selected block into at least two non-picture layers comprises compressing the non-picture block into a base non-picture layer and at least one enhancement non-picture layer.

4. The method of claim 3, further comprising transmitting the base non-picture layer on the transmission channel prior to transmitting the at least one enhancement non-picture layer on the transmission channel.

5. The method of claim 3 wherein compressing the non-picture block into a base non-picture layer and at least one enhancement non-picture layer comprises losslessly compressing the non-picture block.

6. The method of claim 1 wherein dividing the selected block into at least two non-picture layers comprises downsampling the data in the non-picture block.

7. The method of claim 1 wherein compressing the selected block using a second compression method and dividing the selected block into at least two picture layers comprises compressing the picture block into a base picture layer and at least one enhancement picture layer.

8. The method of claim 7, further comprising transmitting the base picture layer on the transmission channel prior to transmitting the at least one enhancement picture layer on the transmission channel.

9.   The method of claim 7 wherein compressing the picture block into a base picture layer and at least one enhancement picture layer comprises compressing the non-picture block using a lossy type compression.

10.   The method of claim 1 wherein dividing the selected block into at least two picture layers comprises separating wavelet coefficients into at least two separate layers.

11.   The method of claim 1 wherein classifying the one or more data blocks as either picture blocks or non-picture blocks according to a set of criteria comprises:

choosing one of the one or more data blocks to classify;

counting a number of discrete colors of pixels making up the chosen block;

dividing the discrete colors into a dominant group and a non-dominant group based on a number of times the discrete colors appear in the chosen data block; and

determining that the chosen block is a picture block if the number of counted discrete colors is above a threshold percentage of the total number pixels in the chosen block.

12.   The method of claim 11 wherein the threshold percentage is a percentage selected from a range of about 10-40.

13.   The method of claim 12 wherein the threshold percentage is 25.

14. The method of claim 11, further comprising determining that the chosen block is a picture block if the number of pixels having a color in the dominant group is fewer than a total threshold of a number of all of the pixels in the chosen block.

15. The method of claim 14 wherein the total threshold is a percentage selected from a range of about 80-85.

16. The method of claim 15 wherein the total threshold is 90 percent.

17. The method according to claim 2, wherein transmitting the selected data comprises transmitting the selected data on a LAN connection between two or more computers.

18. The method according to claim 2, wherein transmitting the selected data comprises transmitting the selected data from a media server to an image projector.

19. The method according to claim 2 wherein transmitting the selected data comprises transmitting the selected data from a media server to a decoding device.

20. A multi-layer coding system, comprising:

a frame divider configured to break a frame of data into one or more data blocks;

a block classifier configured to classify the one or more data blocks as either picture blocks or non-picture blocks;

a block comparer configured to compare one of the one or more data blocks to another block, and to generate a comparison signal at an output;

a re-use indicator coupled to the output of the block comparer and configured to generate a re-use signal based on the comparison signal;

a non-picture block compressor configured to compress and divide a non-picture block into a base non-picture layer and one or more non-picture enhancement layers using a first compression system; and

a picture block compressor configured to compress and divide a picture block into a base picture layer and one or more picture enhancement layers using a second compression system.

21.   The coding system of claim 20, further comprising a data transmitter structured to transmit data on a computer network.

22.   The coding system of claim 21 wherein the data structured to be transmitted is selected from the group consisting essentially of the re-use signal, the base non-picture layer, the one or more non-picture enhancement layers, the picture block, and the one or more picture enhancement layers.

23.   The coding system of claim 20 wherein the block comparer is configured to compare blocks from two different frames of data.

24.   The coding system of claim 20 wherein the block classifier comprises a color quantizer and a color counter.

25.   The coding system of claim 20 wherein the non-picture block compressor comprises:

a color palette indexer for generating an index value for colors of pixels making up the non-picture block; and

a layer separator configured to divide indexed values of the non-picture block into two or more layers.

26. The coding system of claim 25 wherein the non-picture block compressor further comprises a run length encoder to encode the two or more layers into the base non-picture layer and the one or more non-picture enhancement layers.

27. The coding system of claim 26, wherein the non-picture block compressor further comprises a Golomb coder structured to convert an output from the run length encoder into the base non-picture layer and the one or more non-picture enhancement layers.

28. The coding system of claim 20 wherein the picture block compressor comprises:

a wavelet coder configured to generate wavelet values from the picture block; and

a layer separator structured to divide the wavelet values into two or more layers.

29. The coding system of claim 20 wherein the picture block compressor comprises an integer based lowpass/highpass processor.

30. The coding system of claim 29 wherein the integer based lowpass/highpass processor comprises:

an average processor configured to produce an average value for a number of adjacent pixels in the picture block; and

a difference processor configured to generate difference wavelet values for the number of adjacent pixels in the picture block.

31.   The coding system of claim 28 wherein the picture block compressor further comprises a wavelet quantizer structured to scale the wavelet values.

32.   The coding system of claim 28 wherein the picture block compressor further comprises a wavelet normalizer structured to normalize the wavelet values.

33.   The coding system of claim 28 wherein the picture block compressor further comprises a wavelet remapper that is structured to map wavelet values into non-negative integer values.

34.   The coding system of claim 28 wherein the picture block compressor further comprises a run length encoder to encode the two or more layers into the base picture layer and the one or more non-picture enhancement layers.

35.   The coding system of claim 34, wherein the picture block compressor further comprises a Golomb coder structured to convert an output from the run length encoder into the base picture layer and the one or more picture enhancement layers.

36.   A data transmission system, comprising:
a data encoder, including:
        a frame divider configured to break a frame of data into one or more data blocks,
        a block classifier configured to classify the one or more data blocks as either picture blocks or non-picture blocks,

a non-picture block compressor configured to compress and divide a non-picture block into a base non-picture layer and one or more non-picture enhancement layers using a first compression-division system, and

a picture block compressor configured to compress and divide a picture block into a base picture layer and one or more picture enhancement layers using a second compression-division system;

a transmission scheduler coupled to the encoder and having an input terminal to accept encoded layers of data, and having an output terminal coupled to a transmission channel; and

a server coupled to the transmission channel and structured to distribute the encoded layers of data to one or more receiving units.

37. The data transmission system of claim 36 wherein the block classifier in the data encoder comprises a color quantizer and a color counter.

38. The data transmission system of claim 36 wherein the non-picture block compressor comprises:

a color palette indexer for generating an index value for colors of pixels making up the non-picture block; and

a layer separator configured to divide indexed values of the non-picture block into two or more layers.

39. The data transmission system of claim 36 wherein the picture block compressor comprises:

a wavelet coder configured to generate wavelet values from the picture block;

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41

5   a layer separator structured to divide the wavelet values into two or more layers.

40.   The data transmission system of claim 39 wherein the wavelet coder comprises:

10   an average processor configured to produce an average value for a number of adjacent pixels in the picture block; and

a difference processor configured to generate difference wavelet values for the number of adjacent pixels in the picture block.

15   41.   The data transmission system of claim 36 wherein the picture block compressor further comprises a wavelet quantizer structured to scale the wavelet values.